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EXAMINER

BROWN, MICHAEL J

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 01/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/601,222	<b>Applicant(s)</b> JEDDELOH ET AL.	
	<b>Examiner</b> Michael J. Brown	<b>Art Unit</b> 2116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-124 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-124 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/20/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/23/2005</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statements (IDS) submitted on 6/20/03, 11/10/03, 1/16/04, 2/26/04, 5/7/04, 7/15/04, 1/7/05, 3/7/05, and 6/23/05 were. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: memory hubs 528 and 532 are not shown in the drawings. Also, the drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 286 and 284. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1-124 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor(US PGPub 2004/0024959) in view of Wurzburg et al.(US Patent 5,546,591) further in view of Eggers et al.(US PGPub 2004/0199730).

*In reference to claims 1, 26, 48, 74, and 100.....*

Taylor discloses a system, computer system(computer system 600, see Fig. 6) and method for controlling power, comprising a processor(processor 604, see Fig. 6), an input device(input devices 618, see Fig. 6), operably connected to the processor, allowing data to be entered into the computer system, an output device(output devices 620, see Fig. 6), operably connected to the processor, allowing data to be output from

the computer system, and a memory system(data storage 624, see Fig. 6), operably coupled with the processor. Taylor also discloses the memory system comprising a memory controller(system controller 607, see Fig. 6), a memory bus(optical link 465, see Fig. 6) operably coupled with the memory controller to communicate memory commands from the memory controller and communicate memory output signals to the memory controller, and a plurality of memory modules(memory modules 450a-450n, see Fig. 6) operably coupled with the memory bus, the memory modules generating memory the output signals and responsive to the memory commands. Taylor further discloses at least some of the memory modules comprising an insulative substrate supporting a system interface(see paragraph 0033, lines 8-9), a plurality of memory devices(memory devices 448, see Fig. 6) disposed on the insulative substrate, and a memory hub(memory hub 470, see Fig. 6) disposed on the insulative substrate and operably coupled with the memory devices and the system interface, the memory hub managing communications between the memory devices and the system interface in response to memory commands received via the system interface.

However, Taylor fails to disclose the system, computer system, or method comprising an activity sensing device monitoring activity of the memory module in processing memory commands and generating an output corresponding thereto, and a module power controller operable to direct the memory module to a reduced power state responsive to the output of the activity sensing device indicating activity of the memory module is not of a desired level.

Wurzburg et al. teaches an activity sensing device(activity monitor 34, see Fig. 2) monitoring activity of the memory module in processing memory commands and generating an output corresponding thereto, and a module power controller(local power management unit 38, see Fig. 2) operable to direct the memory module to a reduced power state responsive to the output of the activity sensing device indicating activity of the memory module is not of a desired level. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the inventions of Taylor and Wurzburg et al. in order to create a computer system with memory module monitoring means. The motivation to do so would be to establish an ability to conserve power when there is inactivity within a particular memory module.

In reference to claims 2, 27, 49, 75, and 101....

Wurzburg teaches the system, computer system, and method wherein the module power controller directs the memory module to the reduced power state when the activity sensing device indicates memory module activity has fallen below the desired level(see column 3,line 66- column 4, line 14).

In reference to claims 3, 28, 50, 76, and 102....

Wurzburg teaches the system, computer system, and method wherein the module power controller directs the memory module to the reduced power state when the activity sensing device indicates memory module activity has exceeded the desired level(see column 3,line 66- column 4, line 14).

In reference to claims 4, 29, 51, and 77, and 103....

Wurzburg teaches the system, computer system, and method wherein the module power controller is operable to determine when the memory module should be directed to the reduced power state responsive to the output of the activity sensing device(see column 3,line 66- column 4, line 14).

In reference to claims 5, 31, 52, 78, and 104....

Wurzburg teaches the system, computer system, and method wherein the module power controller is operable to direct the memory module to the reduced power state upon receiving an external reduced power signal(see column 3,line 66- column 4, line 14).

In reference to claims 6, 32, 53, 54, 79, and 80....

Wurzburg teaches the system, computer system and method wherein the module power controller comprises a master power controller(central power management unit 32, see Fig. 2), the master power controller receiving the output of the activity sensing device from at least one other memory module and, responsive to the output of the activity sensing device indicating activity of the memory module is not of the desired level, generates an external reduced power signal to direct the at least one other memory module to the reduced power state.

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In reference to claims 7, 33, 55, 81, and 109....

Wurzburg teaches the system, computer system, and method wherein the memory module is directed to the reduced power state by the module power controller responsive to a single indication the activity of the memory module is not of the desired level reflected in the output of the activity sensing device.

In reference to claims 8, 34, 56, 82, and 110....

Wurzburg teaches the system, computer system, and method wherein the memory module is directed to the reduced power state by the module power controller responsive to a plurality of indications the activity of the memory module is not of the desired level reflected in the output of the activity sensing device(see column 3,line 66-column 4, line 14).

In reference to claims 9, 35, 57, 83, and 111....

Wurzburg teaches the system, computer system, and method wherein the memory module is directed to the reduced power state by the module power controller when the output of the activity sensing device indicates the memory module has not received memory commands for a predetermined time period. (see column 3,line 66-column 4, line 14).

In reference to claims 10, 36, 58, and 84....



Wurzburg teaches the system, computer system, and method wherein the activity sensing device comprises an activity monitor that monitors memory commands directed to the memory module(see column 3,line 66- column 4, line 14).

In reference to claims 11, 30, 37, 59, and 85....

Wurzburg teaches the system, computer system, and method wherein the activity monitor monitors the memory commands received via the system interface(see column 3,line 66- column 4, line 14).

In reference to claims 12, 60, 86, and 112....

Wurzburg teaches the system, computer system, and method wherein the activity monitor comprises part of the memory hub(system bus 28, see Fig. 2).

In reference to claims 13, 38, 61, 87, and 113....

Taylor in view of Wurzburg discloses the system, computer system, and method as cited and explained above. However, Taylor and Wurzburg fail to disclose the system, computer system, and method wherein the activity sensing device comprises a temperature sensor wherein the temperature sensor is operable to measure when the activity of the memory module is not of the desired level by monitoring temperature.

Eggers teaches an activity sensing device comprising a temperature sensor(temperature sensor 4.1 and 4.2, see Fig. 1) wherein the temperature sensor is operable to measure when the activity of the memory module is not of the desired level

by monitoring temperature(see paragraph 0028, lines 5-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the inventions of Taylor, Wurzburg, and Eggers to create a computer system with memory module monitoring means depending on temperature. The motivation to do so would be to establish an ability to conserve power when there is an unstable temperature issue within a particular memory module.

In reference to claims 14, 39, 62, 88, and 114....

Eggers teaches the system, computer system, and method wherein the temperature sensor is operably coupled with at least one memory device to measure a memory device operating temperature(see paragraph 0036, lines 8-11).

In reference to claims 15, 40, 63, 89, and 115....

Eggers teaches the system, computer system, and method wherein the temperature sensor is operably coupled with each of the memory devices to measure an aggregate memory device temperature(see paragraph 0036).

In reference to claims 16, 41, 64, 90, and 116....

Eggers teaches the system, computer system, and method wherein the temperature sensor is operably coupled with the insulative substrate to measure a memory module operating temperature(see paragraph 0036).

In reference to claims 17, 42, 65, 91, and 117....

Eggers teaches the system, computer system, and method wherein the temperature sensor is operably coupled with the memory hub to measure a memory hub operating temperature(see paragraph 0036).

In reference to claims 18, 43, 66, 92, and 118....

Eggers teaches the system, computer system, and method wherein the temperature sensor further comprises an ambient temperature sensor so that a measured temperature of the memory module can be compared to an ambient temperature(see paragraph 0036).

In reference to claims 19, 67, and 93....

Taylor discloses the system and computer system wherein the plurality of memory devices comprise a plurality of DRAM devices(see paragraph 0021, lines 7-10).

In reference to claims 20, 68, 94, and 119....

Taylor discloses the system, computer system, and method wherein the reduced power state comprises a reduced refresh state in which memory cells of the DRAM devices are refreshed less frequently(see paragraph 0024).

In reference to claims 21, 69, 95, and 120....

Taylor discloses the system, computer system, and method wherein the reduced refresh state comprises a self-refresh state(see paragraph 0024, lines 26-27).

In reference to claims 22, 44, 70, 96, and 121....

Wurzburg teaches the system, computer system, and method wherein the reduced power state is a reduced response mode in which the module power controller limits response of the memory module to memory commands to control power consumption by the memory module(see column 3, line 66- column 4, line 14).

In reference to claims 23, 45, 71, 97, and 122....

Wurzburg teaches the system, computer system, and method wherein the module power controller limits the response of the memory module to memory commands by mandating idle intervals between responses to memory commands by the memory module(see column 3, line 66- column 4, line 14).

In reference to claims 24, 46, 72, 98, and 123....

Wurzburg teaches the system, computer system, and method wherein the output of the activity sensing device communicates that the memory devices of the memory module currently store no programming instructions and data, and the power management controller causes a plurality of devices of the memory module to be powered off(see column 3, line 66- column 4, line 14).

In reference to claims 25, 47, 73, 99, and 124....

Wurzburg teaches the system, computer system, and method wherein the output of the activity sensing device communicates that the memory devices of the memory module currently store programming information that has not been accessed by the system for an extended period, and the power management controller causes the contents of the memory devices to be saved to a storage device and a plurality of devices of the memory module to be powered off(see column 3, line 66- column 4, line 14).

In reference to claim 105....

Taylor discloses the method wherein the outside control device resides in a memory controller(see paragraph 0044, lines 10-13).

In reference to claim 106....

Taylor discloses the method wherein the outside control device resides in a system controller(see paragraph 0044, lines 10-13).

In reference to claim 107....

Wurzburg teaches the method wherein the outside control device resides in a master memory module(see column 3, lines 35-39).

In reference to claim 108....

Wurzburg teaches the method wherein the outside control device for other memory modules resides within the memory module(see column 3, lines 35-39).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Brown whose telephone number is (571)272-5932. The examiner can normally be reached on Monday-Friday from 7:00am to 3:30pm(EST).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIRS) system. Status information for the published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications are available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 886-217-9197 (toll-free).

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